Math 222: Honors Calculus IV

Spring 2022

Instructor: Dr. William Worden
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Office: Herman Brown Hall 420
Classroom, time: HRZ 212, MWF 1-1:50pm
Course webpage: https://canvas.rice.edu/courses/46127

Office Hours: TBD. My posted office hours are time that I reserve for students—feel free to come without notice, and stay as long as you like. If you cannot make it during posted hours, or you would like to talk one-on-one, please send me an email to set up an appointment.

Piazza: This class will use Piazza, an online forum for asking and answering questions. I will check in frequently on the Piazza page and answer questions in as timely a manner as possible. Students can also answer other students' questions (and I encourage you to do so!). You can sign up for Piazza here:

piazza.com/rice/spring2022/math222

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Use the access code **Math222S22** to access the course. **You can also access the Piazza page via the Piazza tab on Canvas.** Note that other than office hours (and in class!), Piazza is the preferred method for asking question about course content (homework, concepts, etc.). When you ask a question on Piazza, the whole class benefits from the discussion. In addition, you can ask your question anonymously, if you prefer. When a new question appears, I will get email notifications, so there is no need to send a separate email about a question.

Calendar: A calendar for the course is maintained on the course webpage. I will publish class notes and homework assignments on the Calendar.

Textbook: Advanced Calculus by Gerald Folland. Available at the campus bookstore here: https://tinyurl.com/ycx2tda7, and at Amazon here: https://tinyurl.com/3msmfeby. There are many used copies on Amazon for around $50, which cheaper than renting from the bookstore (and much cheaper than buying from the bookstore).

Course Delivery: This course will be conducted over Zoom until January 24th, per Rice policy. Students may access the Zoom meeting via the link provided on the Zoom tab of the Canvas page. Sharing video on Zoom during class is encouraged and appreciated, but not required. I understand that some students do not have the ability to share video (e.g., a bad internet connection), and some students are just more comfortable not sharing. I will (try to) open the meeting 10 minutes before the start time, and will be happy to answer questions or chat during this time. **Please be logged on and ready to start promptly at 1pm.**

Course Aims: Whatever math we learn in this course, we will first and foremost be guided by the 4 axioms of Dr. Federico Ardila-Mantilla:

> Axiom 1. *Mathematical potential is distributed equally among different groups, irrespective of geographic, demographic, and economic boundaries.*
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> Axiom 2. *Everyone can have joyful, meaningful, and empowering mathematical experiences.*
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> Axiom 3. *Mathematics is a powerful, malleable tool that can be shaped and used differently by various communities to serve their needs.*
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> Axiom 4. *Every student deserves to be treated with dignity and respect.*

We will start the course with Chapter 3 of Folland, which focusses on the Implicit Function Theorem and its applications. Following this, the tentative plan is to spend some time learning about the cross product and volumes of parallelograms, before moving on to integration. Though some integration was covered in 221, we will spend a significant amount of time on it in this class. We will review some of the material covered in 221 as needed, and build toward our main goal of proving the Divergence Theorem and Stokes' Theorem.

Course Grade: Your grade in the course will be based on participation (14%), homework (40%), a midterm exam (20%), and a final exam (26%). Details on each of these assessments are below. Your final letter grade will be based on the following scale:

A/A-	$80-100\%$
B+/B/B-	$60-80\%$
C+/C/C-	$45-60\%$
D+/D/D-	$30-45\%$
F	$0-30\%$

Exams: There will be one pledged take home midterm exam, worth 20% of your final grade. It is open books and open notes, but you may not use the internet, calculators, or outside software such as wolfram alpha, or work with other students. It will be a 90 minute exam, which you will have 7-10 days to complete and upload to Gradescope. **The week of the midterm will be set based on student feedback on a survey given in the first week of classes**.

There will be one pledged take home final exam, worth 26% of your final grade. It is open books and open notes, but you may not use the internet or work with others. It will be a three hour exam, which you will have a week to complete and upload to Gradescope. The deadline for submitting the final exam will be determined by the registrar, and we will discuss an agreeable release date for the final exam. **It is your responsibility to inform me in writing as soon as possible and no later than three weeks before the exam if you have a conflict**.

Homework: Homework will count for 40% of your final grade. There will be weekly written homeworks, which you must scan and upload to Gradescope on Thursdays by 11pm local time (tentatively).

Your TWO lowest/nonexistent homework scores will be dropped. I will also grant individuals one extension up to 2 days on a homework set of their choice. **To request an extension please email me at least 24 hours ahead of the deadline** and indicate your desired due date and if the extension is requested for personal reasons (no need to elaborate), unusually heavy workload in other classes, or other mitigating circumstances (no need to elaborate). Additional extensions will be granted for serious illness (including COVID-19) and family emergency, though these will require documentation from your magister.

Clearly print your first and last name on your written assignment. The homework is not pledged and you are encouraged to work together with your classmates on the assignments. However, you must write up your solutions individually. Legible handwritten and LaTeX-ed solution sets are both acceptable. Not all homework problems will be graded each week, but you will receive additional credit for completeness. Homework assessment will include credit for good composition (or neatly organizing a computation). The use of full sentences, proper grammar, and overall neatness counts towards 'good composition'.

You are not allowed to look up solutions in any written form; in particular, you are not allowed to look up solutions online. Do not use calculators or outside software unless otherwise specified. Late homework will not be accepted without prior authorization and at least 24 hours ahead of the deadline.

Participation: Participation in the course will count for 14% of your final grade, with each week counting for 1%. Successful participation includes asking clarifying questions about the lecture material, providing solutions or hints to in lecture problems, participating in small study groups to work on homework, and/or actively participating in instructor office hours at least once per week. Uncollegial behavior towards other students, the instructor, or TAs will result in a 0% participation assessment for the week. Students will keep track of their participation each week and submit a self-report prior to the midterm and final exams.

Collegiality and Respect: The Department of Mathematics supports an inclusive learning environment where diversity and individual differences are understood, respected, and recognized as a source of strength. Racism, discrimination, harassment, and bullying will not be tolerated. We expect all participants in mathematics courses (students and faculty alike) to treat each other with courtesy and respect, and to adhere to the mathematics department standards of collegiality, respect, and sensitivity as well as the Rice Student Code of Conduct. If you think you have experienced or witnessed unprofessional or antagonistic behavior, then the matter should be brought to the attention of the instructor and/or department chair. The Ombudsperson is also available as an intermediate, informal option, and contacting them will not necessarily trigger a formal inquiry.

Title IX Responsible Employee Notification: Rice University cares about your wellbeing and safety. Rice encourages any student who has experienced an incident of harassment, pregnancy discrimination or gender discrimination or relationship, sexual, or other forms interpersonal violence to seek support through The SAFE Office. Students should be aware when seeking support on campus that most employees, including myself, as the instructor/TA, are required by Title IX to disclose all incidents of non-consensual interpersonal behaviors to Title IX professionals on campus who can act to support that student and meet their needs. For more information, please visit safe.rice.edu or email titleixsupport@rice.edu.

Disability Resources: If you have a documented disability that may affect academic performance, you should: 1) make sure this documentation is on file with Disability Resource Center (Allen Center, Room 111 / adarice@rice.edu / x5841) to determine the accommodations you need; and 2) contact me to discuss your accommodation needs and provide me with a copy of your Accommodation Letter.

Disclaimer: This syllabus is subject to change, though I will do my best to avoid this. Students will be notified of any changes as early as possible, and will be consulted for feedback as these decisions are made.